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COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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DVB COMPLIANT IS A 'JOKE'

And a sick joke at that. We nominally stay away from complex technical subjects in CTD in recognition that most subscribers are neither engineers by trade nor really interested in what appears on the surface to be an engineering debate. We consider this subject to be so vitally important to the future development of digital television over the coming five year period that for this report we step over our normal subject boundaries. However, we do so in as non-technical a manner as possible to drive home the underlying facts supported by this report.

If you or your firm are planning to develop any level of programming distribution utilising digital (MPEG-2) television technology, we suggest that you stop where you are and ask key questions of equipment suppliers. The answers you receive could well have a direct impact on your own business plans between now and the turn of the century.

Background

Television transmission technology, first developed in the 1930s and refined in the 40s and 50s, was established following "standards" adopted by nations of the world. Three separate, seemingly mutually exclusive standards developed: PAL which found widespread use in Europe and in nations with European roots (i.e., inclusive of New Zealand and Australia); and, NTSC which had American origins but also spread to Japan, Taiwan, and the Philippines in this portion of the world; and, SECAM which was originally a French development later modified by the Russians.

Basically, a television receiver created to receive PAL was quite useless for NTSC or SECAM and all other combinations were likewise hampered. What developed to support these standards were unique television receiver designs initially manufactured within each area of influence; France built SECAM sets, American built NTSC sets, Norway built PAL sets.

This nationalisation or regionalisation of TV receiver design continued through the 60s, the 70's and into the early 80s. New Zealand, for example, continued to manufacture television sets until colour was introduced on a wide scale and only ceased to be a manufacturer of TV receivers for domestic consumption late in the 70s and then only after Japanese and other Asia manufacturers began to export receivers to our PAL standard at pricing which New Zealand suppliers could no longer match.

Analogue television is officially 60 years old as a commercial service this year (using the launching of the first routinely scheduled BBC service as a benchmark from which we begin the clock ticking). It has served the world well but newer technology, namely digital techniques, make analogue transmission about as desirable as coal or wood burning ("steam") locomotives were when the first diesel operated engines appeared.

Digital television has been practical since 1992. With each passing year it has become more efficient, easier to create and transmit and of prime importance less expensive to implement. When digital television broke out of the laboratory into the commercial world it was instantly apparent that "digital standards" were essential. The most obvious demand for standards occurs when you elect a certain technique within the digital realm to transmit television programming and then ask those who design and manufacture television receivers to in turn create TV sets that will properly receive transmissions of the chosen transmission standard. Just as a SECAM analogue receiver is basically useless in New Zealand (where we are PAL), so too would a digital receiver manufactured by firm "A" be useless if it was sold to someone who has access only to digital transmissions using technology created by firm "B."

MPEG, initially suggested as a "standard" by a world society of motion picture engineers, was the proposed "world standard" for digital television. Standards of this sort often require 5 to 10 years to gain approval; MPEG was "sold" to the various national and international bodies who in turn dictate transmission "standards" in a relatively short 30 month period.

As speedy as the approval of "MPEG-2" (the final system adopted as a "standard") was, it was not fast enough. Several commercial firms who had been participants in the original development of digital television could not wait for the "standard" to be approved and rushed into the marketplace with transmission systems (i.e., the means of sending digital signals) and companion receivers (i.e., the means of receiving the digital services). Most of these early systems went to specialised television networks (including cable television programme distribution firms who put the early systems into use on satellite links) and to speciality networks such as those that interconnect hospital theatres for live distribution of new medical techniques.

In the analogue world there are but three basic "standards"; PAL, NTSC and SECAM. In the digital world the equipment designer has the flexibility to create an almost infinite number of "standards." Moreover, given the unique computer driven basis for all digital television, the transmission "standard" can be modified by the system operator by merely typing in a few keystrokes on a computer keyboard at the programme origination site.

In an analogue television system, the "standard" is built into the TV transmitter and TV set at the time of manufacture. A programme transmitter desiring to make a change in the transmission standard could do so only by shutting off his transmitter, getting out a soldering iron and a box of parts and then rewiring his transmitter. This would, of course, be a pretty foolish act if after modifying the transmitter and resuming broadcast none of the TV sets in his coverage area could still tune in the signal after the "standards" change. So for a TV broadcaster to make such a change, and for him to retain his original audience, he would also need to send a team of technicians into the field to physically rewire every television set to receive the new standard.

All of this is totally foolish, of course.

Changing A Digital "Standard"

In a digital television world, when the transmission source enters a few commands on a keyboard to modify the "standard" a properly designed receiver located anyplace within reach of the transmission can simultaneously be reset with a new "standard" as well. Each receiver can have the built-in ability to have its internal standard modified, by remote control, in response to instructions originating at the transmitter.

In other words, receivers built to the same "design standard" as the transmission source become "slaves" to the transmission source. If for any reason (security, marketing advantage, programme sales opportunities) the transmitter operator wishes to change the makeup of the audience, a few keyboard commands at the transmitter and all designated receivers within his area of reach change to a new "standard." Receivers that are not a part of this "design standard" stay in the original "operating standard" and are excluded from receiving a particular broadcast or group of programming.

There are tens of thousands of totally unique "operating standards" available to a digital television broadcaster. With the appropriate equipment installed, he has the ability to individually "address" (communicate with) each receiver in his coverage area, one receiver at a time. This means any single receiver (in a universe of millions of receivers), or any two or more receivers can be "addressed" and "authorised" to receive a change in transmission standard as often as the broadcaster might wish to implement such a change.

Broadcasting To Narrowcasting

Television programme circulation (audience reach) has always been measured by counting the number of homes watching a particular programme. Advertising rates for commercials within or adjacent to programming has always been sold based upon audience measurement. The revenue streams depend upon maximising audiences.

The basis for MPEG-2, as a standard adopted by the appropriate world authorities charged with determining television broadcasting technical standards, was in response to this maxim; maximise the audience. If one world (digital television) "standard" was adopted by all national and international groups, it was presumed that all digital television receivers would in turn be built to that (one) world digital standard.

If, alternately, the full technical ability of digital television was unleashed, quite the opposite would happen; Individual transmission centres could be expected to adopt their own unique "standard" to minimise the inflow of television programming from other transmission centres. In other words, if digital was capable of giving the broadcaster the ability to turn all of the receivers in its coverage area into "slaves" to just its own digital standard, viewers would find the process of tuning in programming from other areas so complex and cumbersome that they would largely cease to view programmes from outside of their immediate region.

In this scenario, while digital television offered the promise of a world standard, it also offered the ability for local transmission centres to send commands to the receivers in the reception region they considered "their own" which would lock out programming from competitive regions or sources. And thus what began as a "world standard" ultimately becomes a series of regional and local "standards" for purely competitive reasons. Digital receivers put into operation within New Zealand, for example, would only respond to digital transmissions originating within New Zealand.

One Universal Receiver Design: Tens of Thousands of Individual Applications

Design and build a MPEG-2 digital television receiver. So far, so good; one design that is technically capable of functioning with any MPEG-2 "standard" transmission. The receiver manufacturer likes this a great deal - he builds just one receiver without regard to where in the world it will be utilised.

But design into the receiver the "software" to allow the receiver to be locked to a transmission standard only after it receives software commands from the television programming centre serving the region where it is first turned on. The programmer likes this because he has within his command the ability, executing a few keystrokes on his transmission computer, to "lock up" every receiver that tunes into his programming service. The very same receiver, carried to a different region can be unlocked and then relocked only with the assistance of a reprogramming service. And the receiver manufacturer controls this function as well as a part of the "after sale, after market" service made available.

Example One

The first professional quality receiver to find its way into the Pacific (and New Zealand), designed on the premise you have just read about, is the Scientific-Atlanta model D9223. This receiver is intended for the broadcast, cable television and semi-professional marketplace. The receiver is initially manufactured in Korea, trans-shipped to Ontario (Canada) where it is mated with a Canadian built "control module" and then shipped to customers. The price is US$1,250 each and the receiver is intended for use in the satellite reception world.

Scientific-Atlanta calls their system PowerVu(tm) and it has been widely sold as the "standard MPEG system" to a variety of national networks (1) including ABC Australia. The Australian PowerVu system is currently in an embryonic test phase but scheduled to become the national standard for all Australian network exchanges within two years.

S-A approaches MPEG-2 as an opportunity for network operators and/or programmers to configure their systems in a flexible manner. They sell a turnkey end-to-end package that begins with the equipment required to turn standard TV programming into digital data streams at the studio and ends with the receiver that accepts the digital satellite programming data streams to be return-converted to an analogue format service capable of being utilised with a standard TV receiver. Any network or programmer electing to utilise the PowerVu transmission side equipment automatically becomes a client for the reception equipment. And that is the key point in this report:

Reception equipment is locked as a slave to the transmission equipment.
If the reception equipment is to perform at all, it must recognise and respond
to digital commands originating at the programme creation centre.

Scientific-Atlanta designs all (PowerVu) systems using end to end command protocols which are unique to PowerVu. A digital television transmission can be configured at the source so that reception is impossible unless the receiver recognises the full protocol data stream. Very small variations in the command protocol information stream makes a receiver inoperable for receiving a particular service. MPEG-2, "the standard," was supposed to sort all of this out. In fact, almost precisely the opposite has occurred.

Receiver Interoperability

The DVB (digital video broadcast) standard, known as MPEG-2, only establishes recommended guidelines for this command protocol data stream. Within the guidelines there are categories of command instructions and within each category a further range of acceptable (for MPEG-2 "compliance") data rates. An example:

The range of identification numbers for packet identification shall be between 100 and 900. Packet identification (known as PID in the trade) is one of four major protocols that define the transmission parameters. The actual PID must be specified within the transmission stream (a number such as 280). PowerVu systems have their own "PID Assignment Table" as do competitive systems from other hardware suppliers such as Philips. It should not surprise you to learn that neither S-A nor Philips, nor any of the other MPEG-2 equipment manufacturers have agreed on PID numbers. Yet each receiver connected (tuned) to a transmission system must know the precise PID number before it will decode the transmission. And there are four separate (similar) numbers that are mandatory and as many as 8 additional number sets which must also not only be correct but known to the receiver before it will unlock a digital transmission.

There are tens of thousands of number combinations possible and not knowing the number is not dissimilar to being asked to open a safe without knowing the combination to the safe.

1/ S-A will be the "standard system" for satellite operator PanAmSat, operators such as Network 10 (Australia), CCTV (China) Alaska Public TV, Cancom and Telesat (Canada) and programmers such as CBC Newsworld, Telemundo, Univision, TV Sur, FilmNet, Worldnet, Asia Business News, Disney and CMT.

This means every receiver manufacturer must have the co-operation of the programme creator or there is no way the receivers can be used within a system. It should surprise you little to learn that S-A does not share its PowerVu numbers with other receiver manufacturers; nor do the 12 other MPEG-2 equipment manufacturers share their addressing numbers either.

So when we get all done, we have every equipment manufacturer, within the broad general guidelines of MPEG-2, creating its own "SI" (system information) or addressing protocols and then treating this system information as proprietary.

Satellite system operator Intelsat in January decided something needed to be done to get past this proprietary approach to MPEG-2. They called a technical meeting for Washington (DC) in May at which they invited as many MPEG-2 equipment manufacturers as they could locate to bring their equipment to the conference where different MPEG-2 schemes would be tested, one against the other, to determine just how far apart the various proprietary standards really are. Each supplier was asked to provide an encoder (the portion that creates the digital signal at the uplink or transmission centre) and one or more receivers. Each firm also supplied engineering personnel and each firm's receivers were connected to the encoder (transmitter portion) digital signal creators present. Then at the engineer to engineer level, they shared "secret" passwords and protocol numbers so that the Philips receiver, for example, could be reset to respond to the secret passwords encoded into the transmissions originating in S-A, Tiernan, DMV (and other) equipment present.

Interoperable. That was the buzz word.

If a Philips receiver, in the hands of a Philips engineer, could be software reconfigured at the test site to properly receive the transmissions from an S-A encoder, then the receiver was called "interoperable with S-A encoding." Note that in each case the receiver builder had to know (be told) the special passwords and numbers that were being transmitted by each of the encoder suppliers before he could reconfigure his test receiver. None of this would be possible in the field unless the receiver was in the hands of a knowledgeable engineer and he (or she) knew the secret passwords.

The tests were divided into four levels of "compliance":

1) Knowing the passwords, could the receiver produce video (TV pictures)?

2) And audio (TV sound)?

3) Was there lip sync (i.e., when a person on screen moved their lips did the sound correspond with the movement of the lips)?

4) Did the receiver produce, using a diagnostics menu built into the receiver, a "SI Table" (set of system technical parameters indicating the receiver actually was comprehending the data stream)?

Despite the sharing of "secret codes" and the presence of skilled engineers to reconfigure receivers for test with various encoders, a number of receivers worked only with their companion encoder. These, then would be the "least interoperable" and therefore the least MPEG-2 friendly brands in the tests. They were:

General Instrument, KDD (Japan) and Thomson.

The tables here show the results of the testing. Note there are degrees of "interoperable." Some receivers when connected to a "foreign" encoder produced video only, some produced video and audio but without "Lip Sync" (LS: indicates the lips moved in synchronisation to the words spoken) and some produced all three properly but failed to display a "SI Table"

Firms Supplying Encoder (transmit side) Units for Tests

CLI, Comsat, Divicom, DMV (NTL), GI, KDD, Philips, S-A, STS, Thomson, Tiernan, TV/Com

Firms Supplying Decoder (receive side) Units for Test

CLI, Divicom, DMV (NTL), GI, KDD, Philips, S-A, STS, Thomson, Tiernan, TV/Com, Wegener which is the diagnostics information built-into MPEG-2 and supposedly available on an installation menu to the engineer making the installation.

A perfect "score" is four "Y" (yes) notations for each decoder (receiver) against each encoder (transmitter). In the Intelsat conducted tests, no receiver even came close to a perfect score. There were 144 opportunities for Y-Y-Y-Y. There were 20, or 14% interoperability. However of those 20, 11 were between encoders and receivers from the same manufacturer (one assumes a receiver from Wegener, for example, will work with an encoder from Wegener). Therefore only 9 of 144 tests resulted in interoperability; 6%. To put that into perspective, if 12 firms each manufactured 10,000 receivers of their own design for the marketplace; the market would consist of 120,000 receivers. Of those 120,000 receivers, only 7,500 would work on an MPEG-2 "standard" other than the one standard they were created to work with. And these 7,500 would require "expert field tuning" by a suitably qualified engineer to work "out of" the system they were originally created for.

Encoder	Tiernan				Philips				DMV/NTL				Divicom				CLI			
	V	A	LS	SI	V	A	LS	SI	V	A	LS	SI	V	A	LS	SI	V	A	LS	SI
Tiernan	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	X	X	X	X	Y	N	N	N
Philips	N	N	N	N	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	N	N	N	N	N
DMV/NTL	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
Divicom	X	X	X	X	X	X	X	X	N	Y	N	Y	Y	Y	Y	Y	X	X	X	X
CLI	N	Y	X	X	X	X	X	X	N	N	N	N	X	X	X	X	Y	Y	Y	Y
Comsat	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	N	N	N	N
TV/Com	X	X	X	X	X	X	X	X	N	Y	N	Y	Y	Y	N	N	X	X	X	X
STS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	N	N	N	N
S-A	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	X	X	X	X

Nomenclature: X indicates testing was not completed and results are not available

Encoder	Wegener				TV/Com				STS				Scientific Atlanta							
	V	A	LS	SI	V	A	LS	SI	V	A	LS	SI	V	A	LS	SI				
Tiernan	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	N				
Philips	X	X	X	X	X	X	X	X	X	X	X	X	Y	Y	Y	N				
DMV/NTL	X	X	X	X	Y	Y	Y	Y	X	X	X	X	Y	Y	Y	N				
Divicom	X	X	X	X	Y	Y	Y	Y	X	X	X	X	Y	Y	N	N				
CLI	N	N	N	N	X	X	X	X	N	N	N	N	X	X	X	X				
Comsat	Y	Y	Y	Y	N	N	N	N	X	X	X	X	X	X	X	X				
TV/Com	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N				
STS	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N				
S-A	X	X	X	X	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y				

Nomenclature: Receiver brands horizontally across page. V indicates receiver decoded video. A indicates decoding of audio. LS is for lip sync, a measurement of whether timing between video and audio is correct. SI indicates System Information; could receiver read and display the transmission parameters properly.

One single world MPEG-2 operating standard is, therefore, not yet a reality.

Intelsat created this engineering test session for a number of purposes. As the world's largest international satellite operator, increasingly it is being called upon to relay MPEG-2 format transmissions from point A to point B. To do this properly, it must be able to decode and monitor the content of the transmissions. And increasingly it was finding it could not do this; that signals were being handed to them for satellite relay which they could neither decipher nor properly monitor. It hoped that by spotlighting the dramatic differences between operating systems that it could create a forum for coming to a better agreement for the future standardisation of encoding formats within the framework of MPEG-2.

Frustration At The User Level

At the present time there are six major MPEG-2 operating "systems" in the Pacific. Scientific-Atlanta is operating a trio of PowerVu uplinks (Singapore, Hong Kong and Sylmar, California; all using PanAmSat PAS-2). NBC Asia is operating a second uplink from Hong Kong, equipped by Philips with their Token Mux design MPEG-2 equipment (also on PAS-2). Deutsche Welle, as lead programmer for the European Bouquet (EBB), is uplinking from Israel to AsiaSat 2 using DMV/NTL System 3000 format equipment. Finally, Star TV is uplinking from Hong Kong using DMV/NTL equipment.

Only one of these programme groups presently professes to actually being "MPEG-2 Compliant." That is the EBB service using DMV provided uplink equipment. However, with one exception receivers that claim to be MPEG-2 Compliant and therefore capable of receiving the EBB services will not function with the DMV equipped Star TV service. Most will, however, work with the NBC Philips equipped system which makes no claim to being MPEG-2 Compliant (although clearly it must be if the MPEG-2 receivers work with it). The table here shows which receivers work with the presently available services. Note that where special (conditional access) approval is required, such as services available only by subscription, a new receiver coming out of the box will not work with a service unless a subscription has been entered.

What We Have Learned

Digital television, as set out in the world standard MPEG-2, is anything but a world standard at this point in time. Individual manufacturers have taken the opportunity offered by

Satellite/Service	PowerVu	NTL3000	Panasat	Pace DGT400	Pace DVR500	Pace DVR200
Galaxy/Optus	No	No	Yes	Yes	No	No
Star TV 1/AsiaSat 2	No	No	No	No	No	No
Star TV 2/AsiaSat 2	No	No	No	No	No	No
Star TV 3/AsiaSat 2	No	Yes	No	No	No	No
EBB/ AsiaSat 2	No	Yes	Yes	Yes	Yes	Yes
NBC HK/ PAS-2	No	Yes	Yes	Yes	Yes	Yes
PowerVu Singapore	Yes	No	No	No	No	No
PowerVu HK	Yes	No	No	No	No	No
PowerVu California	Yes	No	No	No	No	No

MPEG-2 to create their own "variations" of the standard although most believe they are well within their rights to do so and still claim they are "MPEG-2 Compliant." A recent citation involving Scientific-Atlanta brings this point home.

S-A literature for more than six months in advance of the release of their PowerVu (model D9223) receiver proclaimed it to be MPEG-2 and "compliant" with the world standard. The system has been sold to network groups such as the ABC Australia based upon these premise.

However, when the S-A PowerVu receiver was tested with the NTL design MPEG-2 transmissions of EBB, it refused to work. On query, S-A admitted the receiver could not work with the NTL MPEG-2 data stream, and that for the receiver to be modified to work with this "version"(2) of MPEG-2 would require the PowerVu unit be returned to an S-A field office (Sydney).

There the unit could be modified by S-A engineers to work with any one of the five programming channels of EBB, but not for more than one. One of the desirable features of MPEG-2 is the ability to push a button on the receiver and have the receiver change from programme channel to programme channel; just as normal TV receivers do. Unfortunately, S-A can only make the D9223 work after factory supervised modification on a single programme channel and the user will not be able to change the programme channel in the field (will require returning it to the S-A Sydney office). Despite this obvious flaw in the design of PowerVu, S-A told CTD:

"*Scientific-Atlanta has demonstrated its leadership and advocacy of interoperability. However, since success is impacted by both encoder and decoder software revisions, control messages, user interfaces, SI, symbol rates, FEC rates and video formats (among other things), our products must be tested with each system under consideration. If Scientific-Atlanta's PowerVu IRDs are desired to work with another vendor's encoding system, we will be happy to discuss with you the business terms and conditions under which such testing will take place.*

"*Should these tests prove successful, Scientific-Atlanta will guarantee that the PowerVu IRDs we ship will meet the same product specification used in the network tests. If the other vendor changes their product software after the testing takes place, Scientific-Atlanta will not guarantee the interoperability of its products in the network. If the initial tests prove unsuccessful, we will be willing to discuss the prospects of further interoperability testing.*"

S-A is no different than the other players in this market. Each is attempting to build a series of customers who must, by the interoperability requirement, depend totally upon the vendor for all IRD (receiver) units to operate their system. And as the networks grow, and more and more receivers are added, the opportunity for the network operator to make a change becomes more and more remote simply because of the costs associated with changing out (replacing) the growing universe of receivers already in place.

How all of this plays out as MPEG-2 technology matures will be the technical and business story of the next five years. We may have designed a world-wide single television system but to date steps taken to initiate MPEG-2 have been pointed in the opposite direction. In the words of a Chinese proverb, *We live in interesting times.*

2/ The EBB "version" of MPEG-2 is in precise conformity to the world-standard; uniquely so at this point in time. Strangely, virtually no receivers will work with this "world standard" version of MPEG-2 although most receivers claim to be "MPEG-2 Compliant."

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a dollar ...

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Satellite TV and Radio

Filipino (Manila based) television network RPN-9 is latest programmer to appear on satellite (Rimsat 142.5E, 3775MHz). Story behind their service on satellite is "unusual" at best. This transponder, which uniquely serves Pacific as well as Asia, was in use to year ago by cellular telephone company. Virtually all Rimsat (130E and 142.5E) transponders are leased to Indian TV programmers and only three transponders (out of 12 possible) on two satellites reach into Pacific (as well as India). EMTV, Papua New Guinea occupies one of these three, Tamil language RAJ-TV has other. Rimsat, the satellite operator, has attempted to sell (lease) this transponder without success. Early in June a test card appeared here announcing availability of transponder giving contact number at Subic Bay (Philippines) uplink site maintained by Rimsat. Shortly after, a repeating 10 minute promotion on behalf of "21 Plus," a self-proclaimed Hindi (Indian) "adult entertainment" channel appeared in lieu of the "for lease" card. The "21 Plus" service promoted was scheduled to run from 1630-2030UTC daily (4.30-8.30AM New Zealand time); a July 1 start date was advertised. The choice of promotional video may have been careless or very deliberate but it drew considerable negative response including a news story on New Zealand National Radio June 25th. National reported the "adult service" was to be free to air (true) and that it contained full frontal nudity and graphically detailed scenes showing sexual activities (not true, based upon both statements from "21 Plus" and the rules governing all television programming in India). The segment shown (and reshown and reshown to the point of wearing out the tape at the uplink in Subic Bay) featured six grotty appearing Indian males ravaging a black hair Indian actress but no nudity (not even bare breasts which is taboo in India), no kissing (also taboo) and certainly no obvious "penetration" in the sexual sense. What it did show were acts of cruelty performed on the woman (each of the males took turns burning her back with a lighted cigarette) and male physical domination to the point of bodily harm and abuse of the actress. At least some Hindi speaking New Zealanders who saw the promotion were convinced the cigarette burning and physical abuse of the actress was "real," not a camera special effect. If, in fact, her cries of agony were not real, she should at least be given the Indian equivalent of an Oscar for her "performance." When the service did not appear as promoted 1 July Rimsat advised CTD on query, "*While the contract with the Indian programmer has been negotiated and signed, we have received no advance payment as of today* (5 July). *When we receive payment, then we will initiate the service.*" In the meantime, Filipino network RPN-9 had appeared on the scene to negotiate rental of the same transponder between the hours of 2200 and 1600 UTC (10AM and 4AM New Zealand time). RPN-9 is uniquely 90% English language, carries a wide assortment of US originated off-network and syndicated programming (Simpsons, Seinfeld). On first blush, this is the sort of off-satellite programming which would be attractive to cable, SMATV and DTH viewers in the Pacific. Alas, life is not so simple. Rimsat advises RPN-9 has signed an initial contract only for 90 days (July 2 to October 1) and the likelihood it will continue beyond that period is not good. Further, RPN-9 is doing its own uplinking directly to the satellite from Manila. They began service July 5 but by July 6th they were off the air. It seems RPN-9 had arranged for uplinking from a seldom utilised 'spare' uplink owned by another TV broadcaster in Manila and Rimsat discovered shortly after the uplinking began the reason why this uplink was seldom used. It turned out to be "defective" because the uplink antenna was spraying RPN-9 signal not only towards Rimsat at 142.5E but also into adjacent satellites at 140 and 145E. And this was causing no end of interference problems for the adjacent satellite operations (which happen to be Russian satellites under the same operational control as 142.5E). From July 6 to 9 RPN-9 was not on satellite but it appeared again on the 9th this time using a new uplink which they hoped would not cause interference to 140 and 145E. End of story? Not quite. The location of the latest uplink receives a very poor quality off-air signal from RPN-9 so the quality of the broadcast being relayed by satellite is so poor as to be virtually unusable by anyone (the picture is badly filled with significant ghosts and the signal level taken off air is weak with "snow" or terrestrial noise). And if RPN-9 does solve this technical problem, will it then be functional in mostly English language high profile USA programming until October 1st? Possibly not. Within hours of its original July 5th launch the station had been told by owners of The Simpsons and Seinfeld that if they were going to use a satellite relay (for whatever purpose that is intended), first they must encrypt their transmissions since they have contracted only for use of the programming within the Philippines; not the wide belt from India to New Zealand which the satellite now reaches. **SO** - how was your day?

ApStar 1A, the replacement for the original "1" lost by the Chinese in another of their fireworks spectaculars, was launched apparently without major mishap on July 3rd at 10.46UTC. There was no live TV coverage of this launch; hardly surprising given the recent win one - lose one history of the Long March launch vehicle. If the operators of ApStar 1A are breathing easier, few others are. The satellite has been launched without having previously cleared a geostationary arc assignment so it is essentially a satellite hovering over the equator looking for a parking spot. Think of it as your worst Monday morning parking nightmare - every parking slot in your parking lot is full, nobody is going to leave soon and you have to use the bathroom. The Chinese consortium that owns ApStar 1A asked for 122E, had that rejected by Thailand, and in the usual Chinese manner have threatened to "park it" at 131E. They did this once before, settling the original ApStar at 131 over the loud objections of Japan (which is using 132E) and Rimsat/Russia (which is using 130E). Ultimately they worked out a deal to use 138E where Rimsat had a reserve parking spot not in use. The essence of that agreement has never been released but apparently included some money changing hands to Rimsat from the ApStar folks. They may feel they can pull off the same ploy again, nudging up close to Rimsat by parking at 131E and then buying their way into another unused Rimsat spot. There are a number of nervous satellite operators in the Asia region waiting to see where 1A tries to park.

Palapa C2M, testing at 124E when last issue of CTD was published, has been moved to location of C1 (113E) where it took over duties of this satellite July 1. C1 arrived on station in February in defective state having lost an estimated 50% of its solar power collection ability and minus several important transponders which either decided not to work as a result of the solar power loss or for some unrelated reason. C2M was to be an in-orbit reserve satellite, not scheduled to be put into service until 1998. With the defective C1, C2M after testing was moved to C1 location where it has taken over the duties. C2M coverage into New Zealand is near mirror image of C1 with no important changes in received signal levels versus previously reported C1 levels (see CTD March 29, 1996, p. 2).

Discovery Network will convert from its present analogue B-MAC feed on PAS-2 to Scientific Atlanta PowerVu MPEG-2 format service July 28/29. The service had originally planned to use the General Instrument MPEG-2 format with an April 1 conversion date; later decided it would join virtually all other PanAmSat programmers with Scientific-Atlanta format. Cable TV affiliates and Sky are receiving their PowerVu IRD units this week (July 15), will conduct testing of PowerVu service July 25-27 and do permanent switch to digital July 28/29.

Confusion department. Intelsat 801, the first in the latest series of does everything C + Ku band satellites, was originally scheduled for August launch to 174E. Following loss of a predecessor Intelsat satellite by the Chinese early this year, all Intelsat launch schedules shifted later and Intelsat rescheduled 801 launch to October. This is vitally important to the Pacific not because we need a new satellite at 174E (recently launched 701 is there and operating just fine, thank you) but because when 801 is launched to 174E, then 701 will be moved to 180E where it will replace ailing and progressively less useful 511. And, that is important because the start-up of programming from USA based UIH (10 English language programme channels for cable TV in the Pacific) is, in turn, dependent upon all of these things happening. Now comes word that Intelsat 801 has been moved out of the 1996 launch schedule at Ariane, found in a July 9th update of the balance-of-year launch schedule released by Ariane. Intelsat, meantime, is quiet about the Ariane announcement. So when will 801 launch, 701 replace 511, and UIH begin transmitting cable programmes to the Pacific? Stay tuned.

PowerVu version of MPEG-2 from Scientific-Atlanta, as installed and tested late in June from Hong Kong on behalf of PanAmSat, ran into significant technical difficulties. S-A had attempted to install and turn-on trio of PAS-2 PowerVu format uplinks simultaneously; one in Sylmar (California), one in Singapore and other in Hong Kong. At CTD press-time the Sylmar PowerVu appears to be operating without major difficulties carrying six programming channels (see page 9, CTD for June 6). Likewise, Singapore uplink, only in use for Singapore Television international channel service (1 full-time, 1 intermittent programming service) appears to be largely functional (although there have been problems with the audio data stream). The precise problem with the Hong Kong uplink is not detailed but it was significant enough to cause the uplink to be turned off shortly after 1 July and for PanAmSat to notify some PowerVu receiver owners that they should hold onto their older style MPEG 1.5 format receivers "for several months more." Under the original swap out terms for the new PowerVu receivers, owners of the older style MPEG 1.5 receivers were to return the 1.5 version units to a Singapore facility upon receipt of the PowerVu replacements. Several in New Zealand had in fact done that when without notice the PowerVu feed established for the new receivers was turned off.

NBC Asia and CNBC now appear on the "menu" transmitted by Star TV's MPEG-2 service on AsiaSat 2 (3900MHz, vertical) but as of July 10th no actual NBC based programming is there; only test bars. NBC has repeatedly told would-be DTH viewers anxious to subscribe to the service from throughout the Pacific that no DTH level of subscription will be available through the PAS-2 feeds; only through AsiaSat 2. However, on

-Revised Ariane Launch Schedule Which Appears To Bump Intelsat 801-

August 07: Telecom 2D; September 10: Echostar 2. October 15: Insat 2D (India) and Measat 2 (Malaysia). November 14: (Should have been 801) PanAmSat PAS-6. December 17: Thaicom 3 and Nahuel 1A.

AsiaSat NBC is using the services of Star TV and the Star TV MPEG-2 format will not be offered to viewers in the Pacific. NBC apparently was not aware of this "change in policy" at Star TV when it agreed to become a part of the Star service package late in 1995. Net result? NBC Asia and possibly CNBC as well will simply not be available except through cable and terrestrial broadcasting outlets in the Pacific proper.

MGM/UA Telecommunications Group and Encore International have formed a partnership to launch two new general entertainment television service channels for distribution through satellite to cable and other viewers in Asia. The services are targeted at SE Asia and India, and although no specific satellite is mentioned, it would appear the two programme channels will show up on PAS-4 (not visible from New Zealand). Programming will consist of MGM and United Artists movies and television programming created by both firms after completed runs in pay and broadcast TV windows. The service is to be known as MGM Gold and MGM Superstation.

NBC Asia has stopped authorising motels/hotels in New Zealand for NBC Asia service; still signing agreements for CNBC. The network has stumbled into a myriad of New Zealand clearance copyright tangles (see report under terrestrial broadcasting, this issue) and while in May they were offering free IRD (decoders) to any motel/hotel with 100 or more rooms for both CNBC and NBC Asia programme channels, offer has been scaled back to only CNBC. Lodging facilities agree to pay US$0.06 per occupied room per night for NBC Asia and CNBC, half that rate for CNBC only with network supplying Pace model DVR-500 IRD (decoder). Hotel/motel is responsible for its own satellite dish system and distribution system for TV sets. For lodging facilities of under 100 rooms, NBC offers them opportunity to purchase the IRD for US$600; approximately 50% below the present selling price of similar units (the DVR-500 is not itself available in the marketplace; only as a part of the NBC service offer).

Panasat IRD520, manufactured in South Africa for use with Multichoice pay TV service there transmitted on pair of Ku band transponders from PAS-4, has become available as "free to air" MPEG-2 receiver in Australasia. There are problems. The receivers shipped into Australia to date have been packaged and programmed for Multichoice whereas the users here wish them for use primarily with C-band European Bouquet (EBB) and other (temporarily) FTA services. The receivers tested to date require both considerable skill and tender care to initially find European Bouquet transmissions and once found are best left totally alone since any change in the receiver settings will usually lose EBB for a frustrating period of time. The receivers are capable of high quality reception from Deutsche Welle, Spain's RTVE, French TV5 , and Italian RAI Uno plus French MCM (the latter two not yet operating) and at this writing are the only available units capable of supporting DTH. They also allow tuning in of the NBC Asia and CNBC digital feeds from PAS-2 although this will be temporary only until NBC initiates a conditional access routine. EBB, on the other hand, will remain a FTA albeit digital service, permanently. The IRD520 is being sold initially by OPAC Pty Ltd. (A$1199) which was the first to import them from South Africa. However, at CTD press-time several additional directly-importing sources are cropping up including Bay Satellite in New Zealand (64-6-878-9081) and Antares Satellite Products in Australia (61-7-3205-7574). Additionally, Telsat Communications Ltd in NZ (06-356-2749) also has the units through Australian importer OPAC. The South African mindset as to who can be established as an importer and how the units will be distributed appears at this point in time to be a bit of a "free for all." Virtually anyone ordering the units is being accommodated and this is perhaps fuelled by a recent downturn in sales of Multichoice systems in South Africa where the trade press reports a significant sales slump. Australia and New Zealand appear as a "new market" for these units which South African sources indicate are now growing in inventory quite rapidly there. There are more wrinkles. The IRD520 is very similar in design and function to the Australian Galaxy DGT-400 unit; the satellite receiver used for DTH service. Multichoice, like Galaxy, relies upon a conditional access module (which the first IRD520 units shipped to Australia had in place) and a "Smart Card" which is the purchase-from-Galaxy "ticket" that makes the unit play on Galaxy services. The IRD520 will accept a Galaxy "Smart Card" and with it gives immediate access to all of the Galaxy delivered pay TV services available. There is no thievery here - the subscriber must still pay for the Galaxy Smart Card and is at most

-CORRECTION-

CTD for June 6 (page 5) reported on the recent construction progress of New Zealand's first privately owned Teleport in Whangaparaoa. We incorrectly stated the name of both firms involved in this business. For the record, the antenna supplier is Pacific Antennas Limited and the correct name of the teleport operator is New Zealand Teleport Holdings Limited. The Managing Director of both is Bryon G.G. Evans (tel/fax 64-9-424-0841).

simply using a not-supplied-by-Galaxy receiver in lieu of the Pace built and Galaxy distributed DGT-400. At least one Australian source marketing the IRD520 is advertising that this receiver does two things for the user: It will receive EBB (plus NBC), and, it will (with the addition of a Galaxy sold Smart Card) also receive the Galaxy DTH pay service. This is a partial truth since Smart Card sales are presently closely managed and it will not be straight forward to obtain a Galaxy Smart Card to use with a non-Galaxy supplied receiver. For now the Panasat is coming in, it works (under the proper conditions), and it has the market pretty much to itself alone. That will change. (Panasat [Panasonic South Africa], Anthony Resnik telephone 27-11-313-1400).

Pace DVR-200, promised as a FTA MPEG-2 unit by Australian importer Skandia Electronics (Melbourne) continues not to be available; Skandia and Pacific Satellite (Hong Kong where it will also be available) are blaming a disagreement between Pace and Dutch based Irdeto which owns significant receiver software rights for the delay in availability. However, a European source close to Pace advised CTD on July 9th, "*I have checked with Pace and they say the problem with Irdeto should be resolved today (9th) and distribution begin in a 'couple of weeks' to Australia, Hong Kong and New Zealand.*"

Christchurch Japanese family that sued city over ruling that it had to dismantle a 3m satellite dish installed to allow it to view NHK telecasts from Tokyo has lost case. Although backers of the case which would have created new benchmark for city rights to demand compliance of home dish system owners had predicted an appeal if the family lost in court, this is not to be the case. For reasons apparently unrelated to court decision, family is returning to Japan and dish has been removed from property. Satellite system installers in Christchurch area are attempting to find a neutral ground for future city approvals of dish antennas that exceed statutory 1m limit.

AsiaSat, the satellite owner and operator, went into the public marketplace June 18/19 with an issue price of HK$19.80 per share. The demand quickly outpaced the supply of 121 million shares and the offering ended the first day trading at HK$24.75 per share. The proceeds of the sale will be largely devoted to construction of AsiaSat 3 (late 1997) and 4 (1999).

The Value Channel, Australian home shopping service, launched on schedule 1 July on temporary PAS-2 transponder (4180 MHz, vertical). The service is being carried full-time by Far North Cable TV Ltd. in Doubtless Bay, will be added by other cable firms and at least one UHF television station (Palmerston North) shortly. TVC provides toll free 0800 NZ number to facilitate ordering of merchandise shown, does grouping of merchandise offered by category and provides a royalty paid to cable (and broadcasters) for all orders originating within their service area. A similar feed in FTA analogue PAL is planned for AsiaSat 2 within next 30 days. The PAS-2 transponder presently being utilised will be replaced with 3730 horizontal sometime after 1 September.

Conjecture department (and clearly so labelled): Optus Vision (cable television operator in competition with Galaxy DTH and Foxtel cable) is rumoured to be readying launch of multiple channel satellite service using Optus satellite "before the end of October."

C-Cube Microsystems is paying US$182m for assets of Divicom having held 5.4% of firm since 1993. Divicom is one of several firms that have developed MPEG-2 encoding and decoding hardware. C-Cube is major supplier of MPEG-2 chipsets for both ends of the digital television system and is supplying MPEG-2 chips to Echostar DBS service (USA), Thomson and others.

Rupert Murdoch has revealed first layer of plans for Japanese directed direct to home (DTH) satellite service he anticipates launching before the end of 1998. The service will have 100 channels of programming but most of these channels will be sourced within Japan, not the normal Murdoch "sky" empire. The service has a name: JSkyB.

A little known department at the world's largest cable TV operator, TCI, is being spun off into a separate corporation with suggested asset value of US$1B. TCI Satellite Entertainment, with stakes in US DBS operator Primestar Partners and ownership of pair of Loral DBS satellites scheduled for launch over next 18 months, will focus on further development of DTH and DBS operations world-wide.

Scientific-Atlanta telephone number change at Atlanta home office: Effective 1 August 770-903-6057 (area code change from 404 to 770). Additionally, S-A has purchased a 300 acre site in Gwinnett County, Georgia where it will consolidate the present 17 facilities spread throughout the greater Atlanta region.

-JANUARY 1997 TRADE SHOW ANNOUNCED-

SPACE Pacific has formally announced dates and confirmed a venue for the trade association's 1997 trade show. **Dates**: January 21-25, 1997 with 21 and 22 optional for those enrolled in Mark Long SPACE Technology course. **Venue**: University of Auckland, Tamaki Campus (same as 1996). Invitations to SPACE members will be mailed early in September; reservations for trade show booths are now being accommodated. Details from 64-9-406-0651 or fax 64-9-406-1083.

-PIRACY UPDATE (Short Form)-

To cope with increasingly skilful "hacks" of their Videocrypt analogue encoding system Sky TV (Europe) has progressively increased the level of encryption. Each new encryption level requires replacement of some or all of the pre-existing "Smart Cards" in use in the field. The current European card, known as "Series 10" (denoting how many variants have come before it) also includes the ability for individual Sky subscribers to be authorised for pay per view (PPV) events such as the recent Tyson-Bruno WBC Heavyweight fight on March 17. To cope with PPV, the series 10 card had to be redesigned from the prior series 9 card. Sky has two reasons to update their Smart Card: First, to incorporate into it new features such as PPV. And second, to stay ahead of the "hackers": who consider each new card both an intellectual challenge and a business opportunity.

Within Europe countries participating in the 'EC' have often incompatible laws regarding the creation, manufacture and sale of "Piracy Smart Cards." Most countries outlaw this activity only as it pertains to television transmissions originating within their borders while other countries consider intellectual piracy to be a "soft crime" and there are few deterrents to organised piracy card sales. Piracy cards are openly sold in most European countries and otherwise reputable trade publications such as WHAT Satellite and Telesatellit are filled with often full page advertisements offering some variant of piracy card services. To this point this has 'worked' because a German company can create piracy smart cards for sale only outside of Germany, a Irish firm can create cards only for sale outside of Ireland and so on; no local law is broken as long as the piracy cards are not openly distributed within the country of manufacture.

To control this the EC has created a 'Green Paper' in which it calls for a rewriting of intellectual theft laws in all member countries. The laws would be uniform throughout the EC, and make it more difficult for piracy firms to operate from within the European Community. Alas, the piracy folks are at least one half step ahead of this proposal and have recently moved their operations to countries in the former 'eastern block' where EC law does not apply. There is a significant, growing problem here and the roots of it are expanding into the Pacific.

Meanwhile in USA, DirecTV and Murdoch's News Datacom have filed federal racketeering charges against 22 individuals charging they have conspired to develop and market counterfeit Smart Cards. The suit admits the DSS security system was broken by the pirate cards, and DSS is supplying a new generation of cards to all DSS subscribers this month. The new cards are intended to make the piracy cards now in circulation unusable. Counterfeit Smart Cards have been seized at two Canadian - US border check points as well as from satellite TV distributors in USA.

We will investigate how this affects us in a future issue of CTD.

Digital TV and Radio

World Radio Network is an interesting source for radio programming, totally free of cost and available to both radio stations (or networks) and cable TV systems without charge. WRN operates from London (World Radio Network, Wyvil Court, 10 Wyvil Road, London SW8 2TG; tel 44-171-896-9000 and fax 44-171-896-9007) and distributes separate radio feeds designed for world-parts on a 24 hour basis using digital audio (CD quality) satellite feed. Years ago radio stations in isolated areas often attempted to take foreign radio newscasts for local AM or FM rebroadcast using short-wave radio feeds. This was never completely satisfactory because of the unpredictable nature of short-wave radio conditions. Satellites change the nature of such a service totally. For New Zealand and Pacific, service is carried "piggy back" within the European Bouquet transponder on programme channel 12. Here is how it works: A 3m size dish for most of New Zealand connected to a suitable MPEG-2 receiver produces left and right hand audio outputs suitable for going directly into radio station console (0dBm) or audio amplifier; in cable TV, directly to cable modulator audio input. WRN is composite of CD quality English language news and feature programmes originating with 24 different nations. They create a 24 hour composite live broadcast day (see typical schedule, p 15 here) and affiliates may take all or any portions they wish. Canadian national radio, CBC, now excerpts out of the WRN feed five hours daily which it broadcasts in the 1AM to 6am on more than 400 AM and FM transmitters across Canada. CBC has found the programming has more than tripled its overnight audience rating and reduced programming costs in the same time slot to 25% of what they were formerly; a winning combination. Most of the programmes are human interest driven, professional radio reports on some topic that is important and interesting from the host broadcast country. Listeners find this gives them new insight into various nations world-wide and the variety of productions aired provides a degree of versatility which CBC had been unable to duplicate with its own staff. Affiliation with WRN is straight forward and requires only a request to become an affiliate and a response approval from Director of Development Jeff Cohen.

WorldSpace, the builder of three purpose designed radio broadcast satellites to cover most of the world from locations over the equator favouring Africa, Asia and the Caribbean, has signed a deal with Thomson and ITT for 2 million receivers. WorldSpace has Matra Marconi building satellites, and reservation in 1998 for launch with Ariane. The concept is that several hundred 'CD quality' radio channels will be distributed from satellites to specially designed receivers. WorldSpace insists it is not in the receiver business but is "seeding" the programme by funding the initial 2,000,000 receivers to ensure that when their service begins there will be sufficient units available to rapidly build an audience of listeners. Project total investment comes to more than US$1B and is being backed by private (undisclosed) investors.

US Congress is holding hearings on next step in implementing HDTV. Federal Communications Commission, after years of study and testing, has developed guidelines for technical implementation and wishes to allocate second TV channel to each present analogue broadcaster with intent that broadcasters should use second channel for development of digital (HDTV) on way to eventual elimination of analogue services. The theory is that with multiple programme channels on digital, broadcaster would have incentive to shift away from analogue and in ten years or more time the present analogue channels would be shut down and reassigned to various two-way radio services. One technical issue has been raised: FCC rules allow either progressive or interlaced scanning of HDTV (digital) services. Computer people favour progressive scanning because that is how they now do it while TV broadcasters want continuation of interlace because ... that is how they now do it. At a time in consumer electronics history when PCs and televisions appear to be on a merger course, the progressive versus interlace argument is not just engineers having an argument. If one standard was adopted the merger of the two "screen formats" would be significantly easier. Computer people are lobbying that FCC rules should favour progressive and not leave broadcasters free to elect interlace. US FCC is currently proposing use of spectrum from 174-216 and 700-820 MHz for HDTV (digital) television channels.

Mitsubishi and former Bell Labs, Lucent, have reached agreement to complete development of a single HDTV chip for NTSC system approved by FCC. Target date: 1998 chip availability which portends 1999 model TV receivers to be equipped

World Radio Network (WRN) Schedule

UTC	CAT	AET	STATION
0100	0300	1100	RTE Dublin
0200	0400	1200	NPR All Things Considered
0300	0500	1300	Polish Radio Warsaw
0330	0530	1330	Radio Budapest
0400	0600	1400	YLE Radio Finland
0430	0630	1430	ORF Radio Austria International
0500	0700	1500	NPR All Things Considered
0630	0830	1630	PRI Market Place
0700	0900	1700	RTE Dublin
0900	1100	1900	Radio Prague
0930	1130	1930	SABC Channel Africa (Mon - Fri) SABC Network Africa (Sat) Radio Romania International (Sun)
1000	1200	2000	RTHK - News from Hong Kong (Mon - Fri) United Nations Radio from New York (Sat) Glen Hauser's World of Radio (Sun)
1030	1230	2030	KBS Radio Korea International
1100	1300	2100	NPR Morning Edition (Mon - Fri) NPR Press Club (Sat) NPR Weekly Edition (Sun)
1200	1400	2200	Radio Canada International
1300	1500	2300	RTE Dublin
1400	1600	0000	Voice of Russia
1430	1630	0030	Radio Vlaanderen International, Brussels
1500	1700	0100	Radio France International
1600	1800	0200	ORF Blue Danube Radio-Vienna (Mon-Fri) Glen Hauser's World of Radio (Sat) SABC Network Africa (Sun)
1630	1830	0230	Radio Netherlands
1727	1927	0327	Earth & Sky - Science & Astronomy series
1730	1930	0330	RTE Dublin
1800	2000	0400	ORF Radio Austria International
1830	2030	0430	YLE Radio Finland
1900	2100	0500	RTHK - News from Hong Kong (Mon - Fri) Radio Romania International (Sat) UN Radio & Health Watch (Sun)
1930	2130	0530	KBS Radio Korea International
2000	2200	0600	Radio Sweden
2030	2230	0630	Polish Radio Warsaw
2100	2300	0700	RTE Dublin
2230	0030	0830	ORF Blue Danube Radio-Vienna (Mon-Fri) United Nations Radio from New York (Sat) Glen Hauser's World of Radio (Sun)
2300	0100	0900	Radio Sweden
2330	0130	0930	Radio Netherlands
0027	0227	1027	Earth & Sky - Science & Astronomy series
0030	0230	1030	Radio Prague

WRN Network Source Stations

ABC Radio Australia, BRTN Radio Vlaanderen International (Belgium), BBC Europe, Blue Danube Radio, Channel Africa (Johannesburg), C-SPAN Radio (USA), Czech Radio Prague, Denmark's Radio, Hungarian Radio, KBS Radio Korea International, National Public Radio (USA), ORF Radio Austria, Public Radio International (USA), Polish Radio Warsaw, Radio Canada International, Radio-Television Hong Kong, Radio Netherlands, Radio France International, Radio Romania, Radio Sweden, Radio Telefis Eireann, Swiss Radio International, United Nations Radio, Vatican Radio, Voice of Russia, YLE Radio Finland with HDTV. Bell Labs will do demodulator to separate digital signals from analogue carriers (TV sets will need to do both analogue and digital, initially), demultiplexer to separate individual programme channels out of digital data stream. Mitsubishi will develop image decoder to decompress encoded video signal, audio decoder, and display processor to transform video + audio signals to various display formats.

Consumer Electronics

Uniden (NZ) Ltd. launch of DTH satellite systems for home marketplace has met or exceeded expectations according to Uniden spokesperson. The company announced entry into C-band satellite system marketplace, using 3.7m "Unimesh" four piece dish manufactured in USA and four models of Uniden brand satellite receivers with built-in satellite dish positioner systems late in May. A series of product training seminars were conducted between June 17 and July 3rd spanning country from Whangarei to Invercargill. Initial emphasis is on placing Uniden dish systems at dealer outlets throughout country; Noel-Leaming new Appliance City in Christchurch will be among first so-equipped.

DVD (digital video discs) is dead as a 1996 product and continues to face tangled opposition and legal hurdles. Technology will place myriad of digital quality video products including movies at disposal of consumers in way that VHS now offers movies and specialised programmes for rent or sale. But with one major difference; in digital form, unless technology intervenes it gives possessor of digital form product virtually unlimited access to making as many master-quality duplicates as they wish. The DVD technology is mature and dozens of plants are ready to begin massive quantities of both DVD players and DVD movie discs. But until there are techniques in place to prevent unauthorised duplication, backed up by legislation in at least the United States to punish those who attempt to circumvent the anti-copying technology, no further progress can be made. A number of separate technology solutions have been offered and there is at least tentative agreement on which one will become the standard. There is less agreement on the precise format of the legislative language to be adopted by the U.S. Congress to ensure that skilled people do not circumvent the anti-copying technology for fun and profit. Industry leaders (Sony, Philips, Matsushita et al) had attempted to bring the unresolved issues to the table for agreement in time to launch DVD on a world-wide basis before the 1996 Christmas season. This is now virtually impossible because of still unresolved issues and the long lead times required to bring the product to market by any specific date. DVD by Christmas? Yes, but 1997, not 1996.

Auckland University has successfully utilised its own internal computer network to distribute live coverage of Russia's recent national elections to a number of campus locations. Feed from Russian satellite received at the University UniSat installation at Tamaki was looped into Information Technology System net for transmission to classrooms in political science, Russian studies and Mathematics.

Camcorder sales in North America edged ahead by surprising 6.3% in first quarter of year, against general downward trend of other home electronic items (colour TVs were down 17.3% at the import dock). Within the camcorder subset, 8mm imports shot ahead by 26.1% while the balance of formats actually dropped 12.4% indicating a sizeable change in buying habits that favours the 8mm devices. The camcorder market continues to record dropouts; firms leaving the field now include Philips, Zenith, Sanyo and Fisher.

Microsoft is entering the consumer electronics field with an infrared remote control that will operate computer from easy chair. Using Windows 95 programming, goal is to allow IR unit to direct home PC to operate wide variety of in-home consumer appliances (from air conditioner to telephone answer machines). Microsoft is currently negotiating with consumer audio equipment manufacturers to provide interface capabilities in future products for coupling to the home PC.

Goldstar is going where no major consumer brand of electronics has gone before; it is officially changing its name to LG Electronics (LGE). Company will spend estimated US$330 million to make sure everyone understands the name change. The LGE brand will appear first in new markets for the firm (Viet Nam, India, China and Brazil) since no education process concerning the changeover is required. Elsewhere in the world, inclusive of New Zealand, the name change will take place during 1997 and 1998. Korean competitor Samsung, meanwhile, is spending US$30m this year to enhance brand recognition of its name on a world-wide basis hoping to benefit from possible confusion generated by the Goldstar-LGE name change.

Theatre quality video projection units, rivalling the best of 35mm film, has been shown at trade show in Philadelphia. Numerous companies, licenses of Texas Instrument Digital Micromirror Device (DMD) chip, show images from theatre size down to more room manageable 80" displays. Price tags vary as function of screen image size and brightness but the old problems relating to sufficient brightness and sufficient detail to compete with film now seem to be solved. Most models offer 120" range display screens in region of US$10,000 with predictions that home units will be half that price within 12 months.

Kodak has announced US$350 digital still camera with 1-Mb internal memory capable of storing 8 or 16 electronic photos. Images are taken from cameras to computer through serial interface where multitude of software programmes can be used to print, store or manipulate images. Kodak says this will be first in a series of "point and shoot" electronic imaging cameras to be brought to the marketplace.

-Worthy of Requoting-

Electronic Industries Association (EIA) president Peter McCloskey on subject of Internet: "How the Web will develop over the next decade is simply beyond anyone's serious comprehension. Currently, the Web's primary access is through the PC, but the potential is there for HDTV, Internet computers, personal digital assistants, personal computer TVs, even intelligent transportation systems or a host of other electronic devices yet to be developed. Real-time audio, video, movies and crisp graphics will all be realities instead of wants. The Web will definitely fuel the growth of the electronics industry as well as be a catalyst for social change."

Not just in Korea, anymore. Korean firms in consumer electronics business are increasingly investing sizeable amounts into R&D and/or production facilities on a world-wide basis. Examples: Daewoo is spending US$30m to open research and development centre in New Jersey, will employ 60 engineers. At same time, company is investing US$10m in new production plant in Myanmar (Burma) with a first year production capability of 200,000 colour TVs, 200,000 VCRs and 70,000 refrigerators. Samsung has monster US$679.5m investment going into UK as headquarters for European expansion including $30.2m into new R and D facility at Middlesex (England). Simultaneously, Samsung is investing US$200m into new colour picture tube plant in Manaus, Brazil with an output capacity of 7,000,000 tubes by 1998.

French based manufacturer Thomson (S.A.), owned 76% by French government and 20% by government owned French Telecom, has been "for sale' for more than a year. It appears a decision is imminent as to buyer with considerable evidence and speculation it will be Korean manufacturer Daewoo. Deal may not be huge in terms of dollars (US$2B is mentioned) because firm has overwhelming debt of more than US$4.8B. French would normally prefer to keep ownership within country but few French firms exist with both sufficient assets and interest in taking over Thomson.

Sony is making marketplace move as a "convergence company" to straddle the blurring line that separates home PC and consumer television equipment. The first two Sony brand home PC units are now entering the market at US$2,200 and $3,000. Entry level product uses 166-MHz Pentium chip, 16-Mb RAM, 2.1-Gb hard drive. In the convergence area, Sony units include 3D graphical interface working with Windows 95 to allow easy access to video, audio and communication capabilities. And there is one-click access to Sony Web site which is marketed as only be available to owners/users of Sony brand computers. Further service backup: One-click on line connection to Sony 24 hour service centre that allows user to talk with centre to discuss problem(s) at same time centre is remotely diagnosing the computer through tie-line.

US law adopted earlier this year sought to restrict "indecent" materials from appearing on Internet; it has been found unconstitutional by 3 judge U.S. District Court in Philadelphia. Court said law, passed within the omnibus 1996 Telecom Act, failed to proper define what constitutes "indecency" and barring a clear legal framework the act could not be put into effect. Next stop: U.S. Supreme Court. One important element that court found: "*The Internet is a unique and wholly new medium of world-wide human communication*" and accordingly found that prior laws and definitions based upon radio or television broadcasting or the print media could not apply.

Nokia, Europe's third largest producer of consumer electronics has been sold to Semi-Tech, Hong Kong conglomerate that includes Japanese Akai, Sansui and sewing machine company Pfaff and Singer in its ownership roster. Nokia lost US$81m on sales of US$525m and announced two months ago plans to abandon consumer electronic business.

Cable/Fibre/MMDS/Pay TV

SKY Network expansion into Whangarei, New Plymouth markets is predicated upon being able to supply minimum of three channels of service. Initial offering has been single (sports) channel with customers receiving Sky without monthly charges until the full channel line-up is available. Sky is committed to providing as close to national coverage as possible for the All Black Rugby and believes it will soften some of the loud criticism over loss of the matches on free to air TV by expanding coverage into as many new areas as possible. Sky continues to allow local UHF telecasters (such as Mainland in Nelson) and cable TV firms (such as in Gisborne) to carry the Rugby events without direct charge; a public relations gesture to soften the loss on an FTA basis through TVNZ.

New Zealand Ministry of Communication has turned deaf ear towards application to utilise 13 and 18 GHz range frequencies for "cable television relay." A number of world-class firms including Hughes Aircraft manufacture specialised cable TV microwave equipment designed to allow transport of a 500 MHz spectrum of cable TV programme channels between communities or within larger city. The technology has been around for more than twenty years and suitable equipment for interconnecting New Zealand cable systems was to be made available until Ministry decided there are conflicts with existing or planned (mostly planned) use of the same spectrum here. Ministry decision firmly closes door on use of 13 GHz, leaves slight hope that some accommodation might be made at 18 GHz. Benefits of system are numerous, allowing scattered suburban communities to be tied directly into a common cable headend without the need for expensive and often impossible to install terrestrial fibre optic or coaxial interconnection networks.

Cable systems throughout New Zealand, including new Telecom and Saturn systems under construction, are studying extensive 45 page draft contract created by Sky to allow cable carriage of Sky Network services (Sports, Movies, Orange); Trackside/Discovery and CNN are generally available directly to cable firms without passing through Sky. Contract gives cable operators a rate break from "retail" if they agree to carry Sky channels, adds incentive for volume connections (reduced rates when cable firm sells a fixed percentage of homes on viewing Sky through cable firm). Sky is in new territory here, views Telecom and Saturn cable rollouts as "direct competition" and while anxious to add new subscribers through cable is not interested in making cable's penetration any stronger than necessary. Sky boasts 30% home penetration (i.e., 3 homes out of 10) in Auckland and Wellington markets at this point and is facing heavy challenge of unknown proportions when Saturn and Telecom begin to market extensive new cable-only programming packages. Saturn will rely heavily on pay per view movie packaging but will need at least sports service package to make significant dent. Sky movies and Orange channel package (other than sports carried there) can easily be replaced by other programme sources available to cable; New Zealand specific sport package, however, is almost impossible for cable to replace at this time. Bottom line: Either carry Sky on Sky dictated terms, or prepare to do battle with terrestrial UHF broadcaster in the marketplace by building on non-sport programming options.

Taupo Cablevision has begun installation of what will ultimately be 6 satellite dishes. System has more than 5km of underground plant now installed in what may be one of the most difficult underground builds in New Zealand. Taupo area is basically lava rock, burial of cable conduit has required importation of specially designer boring tool that is capable of entering ground, going 50m or more below surface before coming back to ground level. As much as 200m of conduit/cable per day is going into the ground; new two story office, studio complex is under construction. System is adopting frequency use plan similar to that used in Australia, beginning forward transmission system at approximately 100 megahertz and reserving region below 100 for return band (two-way) capability. Several tiered levels of programming service are planned including an "economy package" which will translate segment of forward band up to UHF television bands IV/V to allow in home use of inexpensive "block cable converters."

Gisborne Cable TV has installed a second 13GHz microwave link between Hawkes Bay and cable community, plans to bring in Sky Movie Channel on contract to add to existing Sky Sports channel already carried by system.

TVNZ has queried cable operators concerning their interest in having access to BBC World Service for full-time cable distribution, but doubts it can be made available in portions of New Zealand where TVNZ operates regional (UHF) television stations. BBC contract reportedly comes up for renewal in 1997, and feeds taken by TVNZ under present contract makeup important broadcast appeal of regional TV stations as well as providing overnight unattended service for TV1 here. Technically, BBC service is presently available through PAS-2 and As2 digital service feeds with the PAS-2 feed going to Korea and other Asian countries which previously could not access it; As2 feed is for Singapore and Australia. Either satellite could be "tapped" for BBC World Service if TVNZ would allow it. Cable in non-metropolitan regions presently unserved by regional TV stations argue that New Zealanders living beyond reach of regional stations should have access to same BBC World Service programming as those who live in metropolitan areas. To date, TVNZ has shown interest in argument but has not relaxed its "exclusive hold" on the service.

Galaxy, as if it does not already have more problems than it can cope with, has a new one: Piracy decoders for the MMDS service. A firm calling itself Clearview is offering a Galaxy MMDS decoder box which it claims will provide reception from all of the Galaxy MMDS service channels for A$790. This compares with an annual subscription price of A$600 for the Galaxy package but is actually a half step better since there are several MMDS channels which Galaxy is not legally able to offer into homes (such as a second sporting channel intended for pubs and clubs) which the piracy decoder will access.

Echostar, most recent DBS entrant in North America, had signed up 38,0000 subscribers by end of second month. Firm is targeting specific metropolitan markets where cable television rates have recently increased, pushing "alternative" to cable with promotions. In four US markets, Echostar has cut price of DBS home satellite system from suggested US$795 retail to US$200 provided homes agree to take one year subscription to satellite services valued at US$300. RCA (Thomson) have responded by dropping price of their "first generation" DSS receivers to US$399 which some retailers such as Circuit City have further lowered with discount coupons to $349. Canada, with an estimated 150,000 Thomson brand DSS home dish systems installed, continues to walk tight wire regarding legality of using US DBS services. Canadian law makes it illegal to subscribe from Canada to US DBS services but law does not bar ownership of DBS system. That one would purchase a system, install it, without subscribing to services is of course height of bureaucratic myopia. Thomson, in respect of the Canadian law banning subscriptions has until now refused to authorise sale of its DBS unit in Canada, a policy that resulted in 150,000 being sold in the so-called "grey market." Late in June, Thomson changed their policy, authorising its own Canadian distributor to sell DBS units but advising the distributor, "*You just tell purchasers that use of this product for subscription TV reception in Canada is illegal.*" And one week later, Thomson rescinded new policy calling their plan "*a mistake in timing that did not have the support of the Canadian government.*"

28GHz "Cellular television service," widely publicised in New Zealand 18 months ago as being capable of supplying 50 channels of television to metropolitan areas, is still dead in USA. The 28GHz region has been unassigned spectrum and has suddenly become valuable because of growing needs. A new generation of data transmission satellite (supported by Hughes and others) would like this band set aside for space to earth links while another group sees it as a "wireless cable" link (LMDS: local multipoint distribution service) for local looping in urban areas where installation of traditional cables in heavily developed areas is cost prohibitive. Without a frequency assignment agreement, no manufacturer will build equipment there; without equipment there is no export to New Zealand of the necessary transmitters and receivers and without this hardware there is no cellular television in New Zealand. End of story.

New Zealand Telecom parent Bell Atlantic has entered agreement in state of Virginia to allow interconnection between its own telephone plant and the cable service lines of Jones Communications. Agreement allows cable company into long distance service using cable TV plant for local telephone service. Agreement allows Jones to resell unbundled elements of the BA network to both business and private customers. One element of agreement: Jones gets 9% discount for resale of business services, 6% discount for private customers and that will be its operating margin.

Fox News, new Murdoch 24 hour cable news service designed to compete with CNN, will be carried into 10,000,000 cable TV homes within the TCI cable family when the service launches in last quarter of year. Fox had originally offered US$10 per cable home as incentive to cable firms to carry new service but neither TCI nor Fox would confirm the exact incentive that brought TCI into the fold. TCI is receiving option to purchase 20% of nonvoting stock in Fox News channel. Sky News London is already created by Murdoch, is distributed widely through Europe, Africa and now into Australia and Pacific. There has been speculation that Sky News London will be folded into world-wide Fox News World when latter starts operations.

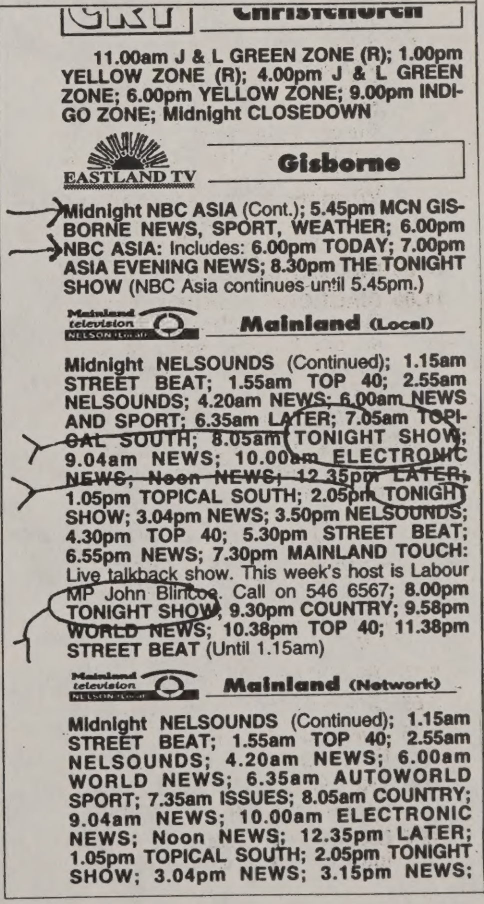
Terrestrial Broadcasting

BAYS Television, UHF station in Nelson, closed down Saturday July 6th in dispute concerning programming rights and charges. Station has been sourcing programming from multiple sources including TVNZ and has mixed ownership that includes prior owners of CTV Christchurch. Station has told local supporters it is unable to meet the programming rates set by present suppliers.

Mercury Television, a new UHF channel 48 station to reach a potential of 71,000 people from Invercargill, is now under construction and staffing up for mid-September launch date. The station plans extensive locally produced programming with a "strong family bias" in a unique "Southland style" including newscasts at 7AM, 10AM, 12.15PM, 7.30PM and 10PM daily. Mercury also plans to be on the air 24 hours daily and is entering into programming agreements for a number of satellite fed services from world-wide sources.

NBC television network, creator of NBC Asia and CNBC services distributed by PAS-2, professes uncertainty about the future "network affiliation agreements" with New Zealand UHF Television stations Mainland TV (Nelson) and Eastland TV (Gisborne). Both stations have been receiving digital satellite feeds from NBC since March-April but there was apparently a misunderstanding concerning which of the NBC programmes were cleared for copyright in New Zealand (see reproduction of TV Guide listing for both stations, here). A spokeswoman for NBC Asia told CTD, "*New Zealand is presenting us with a myriad of problems as many of our scheduled programmes are being utilised (*i.e., broadcast*) even after we have advised the affiliates that certain programmes were not cleared for New Zealand use.*" NBC claims copyright owners have complained to them and in

NBC ASIA programming on Eastland TV, Mainland Television



Christchurch

11.00am J & L GREEN ZONE (R); 1.00pm YELLOW ZONE (R); 4.00pm J & L GREEN ZONE; 6.00pm YELLOW ZONE; 9.00pm INDIGO ZONE; Midnight CLOSEDOWN

EASTLAND TV **Gisborne**

Midnight NBC ASIA (Cont.); **5.45pm MCN GISBORNE NEWS, SPORT, WEATHER; 6.00pm NBC ASIA:** Includes: **6.00pm TODAY; 7.00pm ASIA EVENING NEWS; 8.30pm THE TONIGHT SHOW** (NBC Asia continues until 5.45pm.)

Mainland television NELSON Local **Mainland (Local)**

Midnight NELSOUNDS (Continued); **1.15am STREET BEAT; 1.55am TOP 40; 2.55am NELSOUNDS; 4.20am NEWS; 6.00am NEWS AND SPORT; 6.35am LATER; 7.05am TOPICAL SOUTH; 8.05am TONIGHT SHOW; 9.04am NEWS; 10.00am ELECTRONIC NEWS; Noon NEWS; 12.35pm LATER; 1.05pm TOPICAL SOUTH; 2.05pm TONIGHT SHOW; 3.04pm NEWS; 3.50pm NELSOUNDS; 4.30pm TOP 40; 5.30pm STREET BEAT; 6.55pm NEWS; 7.30pm MAINLAND TOUCH:** Live talkback show. This week's host is Labour MP John Blincoe. Call on 546 6567; **8.00pm TONIGHT SHOW; 9.30pm COUNTRY; 9.58pm WORLD NEWS; 10.38pm TOP 40; 11.38pm STREET BEAT** (Until 1.15am)

Mainland television NELSON Local **Mainland (Network)**

Midnight NELSOUNDS (Continued); **1.15am STREET BEAT; 1.55am TOP 40; 2.55am NELSOUNDS; 4.20am NEWS; 6.00am WORLD NEWS; 6.35am AUTOWORLD SPORT; 7.35am ISSUES; 8.05am COUNTRY; 9.04am NEWS; 10.00am ELECTRONIC NEWS; Noon NEWS; 12.35pm LATER; 1.05pm TOPICAL SOUTH; 2.05pm TONIGHT SHOW; 3.04pm NEWS; 3.15pm NEWS;**

jeopardy are continuation of NBC Asia service to New Zealand telecasters and cable affiliates. The original NBC Asia feed was uplinked in a Scientific-Atlanta MPEG 1.5 format and required the S-A 9222 receiver to access. On July 9th NBC discontinued this MPEG 1.5 feed having previously launched their own Philips constructed MPEG-2 service in mid-June. Some cable affiliates in New Zealand have been provided with the appropriate new receivers for the Philips MPEG-2 service but the status of the receivers at Eastland TV and Mainland is not known. NBC expects to reach a decision concerning allowing affiliates to carry NBC Asia for both cable and UHF TV within 30 days.

US FCC has approved systems that allow high speed data to be transmitted within TV broadcast signal at rates to 384kbps. The presence of the data remains invisible to TV viewer but content can be extracted by appropriately equipped PC for storage or direct use. Four separate systems, each with proprietary technology, have been approved: WavePhone, Yes! Entertainment, A.C. Nielsen and Digideck. All use "overscan" (subvideo) technology. Uses include transmission of games, publications, catalogues and software to PCs.

10 metre dish for use on AsiaSat 2 is under construction at TV3 in Auckland. A smaller (3.7m) dish had originally been installed. New dish is being provided by Pacific Antennas Limited.

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